

## **Seasonal Variation in Family Homeless Shelter Usage**

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Seasonal surges in family homeless shelter usage occur in numerous communities around the United States. These surges are significant because they may place demands on shelter systems, require families to use lower quality shelter facilities, or impose significant costs on the municipalities that provide shelter services. This study uses empirical data from Hennepin County, Minnesota to provide explanations for the seasonality of family homeless shelter usage. The results suggest that multiple factors may contribute to the surge, but that families with school-aged children are the primary driver of seasonal increases in the family shelter population. This study provides initial findings that may help to improve the targeting of homelessness prevention resources.

**Keywords:** homeless, family homelessness, shelter, seasonality, policy

## Introduction

Existing literature has noted that family homeless shelters experience a surge in usage during the summer months (Culhane, Metraux, & Wachter, 1999; O’Flaherty & Wu, 2006). These seasonal surges are significant because they may place demands on shelter systems, require families to use lower quality, overflow facilities, or impose significant financial costs on the municipalities that provide shelter services. While existing research has highlighted the existence of shelter surges, there is a dearth of research that seeks to explain this phenomenon. O’Flaherty and Wu provided possible explanations of the summer surge, but they did not investigate those hypotheses in that study. This study uses empirical data from one community to provide potential explanations for the surge in family homeless shelter populations. The findings also help to develop a deeper understanding of why families enter the shelter system and how local governments and shelter providers may intervene to moderate surges.

This study has significance for both researchers and practitioners. First, its findings may help governments and shelter providers design interventions to reduce the severity of surges in shelter usage and to prevent shelter entry. Second, further explanation of this phenomenon may provide a greater understanding of why families enter the shelter system, which is significant for researchers interested in topics related to homelessness. Given the significant consequences of shelter entry, especially for children (Bassuk & Rosenberg, 1990; Buckner, 2008; Cutuli & Herbers, 2014; Miller & Lin, 1988; Rescoria, Parker, & Stolley, 1991; Samuels, Shinn, & Buckner, 2010; Zima, Wells, & Freeman, 1994) greater knowledge about the causes of shelter entry is beneficial as our society seeks to address this troubling social problem.

This article is split into multiple sections. First, a review of relevant literature is provided to offer context for this study. Second, the data and methods used in this study are described.

The third section summarizes the results of the study. Finally, program and policy implications are discussed. The final section includes a summary of a specific policy that has been implemented by Hennepin County in response to the findings of this study.

### **Literature Review**

Understanding the causes of homelessness is a difficult endeavor. Burt (2001) noted this complexity given that individual attributes combine with structural factors to produce conditions conducive to homelessness. Other studies have outlined a wide variety of predictive risk factors for family homelessness (Bassuk et al., 1997; Shinn, Greer, Bainbridge, Kwon, & Zuiderveen, 2013). These factors include receipt of public assistance, lack of employment, mental health issues, recent eviction, drug use, lack of social supports, previous shelter entry, young children, and housing mobility. While comprehensive, these studies consider the risk of homelessness for a family with given traits, but do not consider how these risks may change throughout the year. Changes in structural factors such as labor markets, weather patterns, school calendar, and evictions and utility shut offs may contribute to homelessness with varied intensity throughout the course of a specific year. Seasonal variation in shelter usage has received limited attention in the scholarly literature, and this study seeks to contribute to the understanding of seasonal changes in family homelessness.

A broad body of literature in multiple disciplines has examined the seasonality of residential mobility. Goodman Jr. (1993) found that housing mobility is much higher in the summer months and that this pattern was evident across demographic groups, throughout the country, and present over the past quarter century. Other studies demonstrated increased levels of real estate transactions (Ngai & Tenreyro, 2009) and moves (Deare, 1993) during the summer. Finally, other studies noted increased mobility among families with school-aged children during

the summer months (Tucker, Long, & Marx, 1995; Tucker, Marx, & Long, 1988). A common theme among residential mobility studies is the significant role that the school calendar plays in moving decisions for families with school-aged children (Deare, 1993; Goodman Jr., 1993; Tucker et al., 1995). These studies provide evidence of a broader phenomenon of increased mobility in the summer, but do not speak to seasonality in demand for family homeless shelters.

A limited body of literature notes seasonal patterns in homeless shelter usage. The existing literature draws a distinction between patterns for individual shelters and those for family shelters. According to Culhane et al. (1999), “well-known seasonal trends cause daily census numbers to fluctuate, with the daily family shelter census peaking in the summer months while the daily adult shelter census peaks in the winter months” (p. 210). In their study of homeless adults in New York City and Philadelphia, Culhane and Kuhn (1998) noted an increase in individual shelter admissions during the winter months. In a study of the family shelter population in New York, O’Flaherty and Wu (2006) found a statistically significant increase in family shelter applications during the summer months of July and August. Although limited in number, these studies provide evidence of seasonal trends in homeless shelter usage.

The literature provides no empirically based explanations for the seasonal patterns identified in the preceding paragraph, but the authors do provide hypotheses about the potential causes. Culhane and Kuhn (1998) suggested that winter surges in adult shelters might be driven by people who have inadequate utilities or by typically unsheltered individuals who may seek temporary shelter due to harsh winter conditions. O’Flaherty and Wu (2006) provided the following potential explanations for the summer surge in family shelters: a) families may be willing to be more mobile when school is not in session, b) doubled-up families find that their hosts may be less accommodating during the summer when temperatures are higher and children

are at home all day, or c) families may exit shelter at a reduced rates during the summer (p. 105). These hypotheses provide a helpful starting point from which to investigate the causes of this phenomenon in Hennepin County. Overall, existing literature indicates alignment between mobility among families who are homeless and general mobility trends, with the most intense activity occurring in the summer months.

Finally, existing literature provides further issues to consider in this study. Both Culhane and Kuhn (1998) and O’Flaherty and Wu (2006) noted the importance of considering the rate of shelter entries and shelter exits to help explain surges in shelter populations. An increase in shelter caseloads could be a function of increased entries into shelter, reduced exits, or a combination of both factors. O’Flaherty and Wu found that both increased demand for family shelter and reduced exits contributed to the significant growth in the family shelter population in New York City.

This study uses Hennepin County, Minnesota as a case to investigate potential explanations of family shelter surges. Within the context of the existing literature, this study seeks to increase the understanding of this phenomenon by answering the following research questions:

- (1) What is the scale and timing of seasonal variation in homeless shelter usage and does this variation persist over time?
- (2) Is the summer and fall surge in family shelter usage in Hennepin County a unique event or is the same phenomenon present in other communities around the nation?
- (3) What factors help to explain the seasonal variation in family shelter usage during the summer and fall months?

## **Methods**

### ***Context***

This study relies on data from the Hennepin County, Minnesota family homeless shelter system. Hennepin County includes the City of Minneapolis as well as surrounding suburban communities. Hennepin County provides a unique policy context in that it has a “right to shelter” policy that mandates that all families who are officially homeless be guaranteed access to shelter. Therefore, the family shelter system capacity in Hennepin County must expand to meet demand in order to comply with county policy. Over the time covered in this study, the Hennepin County shelter system served between 1,000 and 1,500 families per year (*Heading Home Hennepin Update*, 2014). The family shelter system includes two shelters that contract with the county and these shelters provide fixed capacity of 215 rooms. In addition to the fixed shelter capacity, Hennepin County has overflow capacity of 125 rooms at a hotel to serve additional families. This overflow capacity serves families during periods when demand for shelter exceeds the system’s fixed capacity. The overall capacity of the system – fixed and overflow – remained stable over the period of this study. For families who entered the Hennepin County shelter system, the average shelter stay was approximately 45 days over the period of this study. There is no limit on the length of time a family may stay in shelter and the maximum amount of time spent in shelter by a family – during a single spell – over the course of the study was 354 nights.

A number of independent school districts operate within Hennepin County, including the Minneapolis Public Schools. The schools in Hennepin County generally operate on a traditional school year calendar. During the period of this study, the school year tended to start in late August or early September and ended in early June.

### ***Data Sources***

As detailed in Table 1 below, three categories of data are used to answer the research questions identified in this study. The first category includes data from the State of Minnesota and Hennepin County that are used to determine the seasonal patterns of family shelters. The second category of data provides contextual information about residential mobility that may contribute to the understanding of this phenomenon. The third category includes data from other municipalities around the nation that were used to demonstrate seasonal variation in other communities.

#### *Category 1: Hennepin County Shelter Data*

The family shelter data on which this study is based comes from Hennepin County and the State of Minnesota. Details on family shelter usage, entry dates, and demographic information on shelter families were collected from the State of Minnesota's MAXIS data system. The state uses MAXIS to determine eligibility for a variety of social welfare programs. To complement the MAXIS data, the Hennepin County shelter team collects data on families entering shelter during the application and admission process. These shelter data were used to analyze the demand for shelter and the residency status of families seeking shelter. A final source of data in this category includes the intake interview forms that are completed by Hennepin County shelter staff when a family enters the system. To understand the reasons for shelter entry, I coded the answers to the question "Reason for Homelessness Today" from 839 shelter intake interview forms that were conducted by Hennepin County staff members during 2013 and 2014.

The MAXIS data were cleaned and formatted in order to create a functioning database. Observations were dropped if identification numbers were missing, the date of entry occurred after date of exit, or if date of entry or exit was missing. Based on these criteria, a de minimis number of observations were deleted. Key variables used in the analysis included the family

case number, the person identification number, the person's age, date of entry into shelter, and date of exit. New variables were constructed to identify the length of shelter stay (spell) and whether the family had school-aged children (defined as a child age five or older). A spell, as constructed in this study, is complete if a family exits shelter and does not return within seven days.

### *Category 2: Contextual Data*

The second category includes those data that were used to provide context for the increased entries into shelter during the summer and fall months. Eviction data were collected from the Hennepin County court system on a monthly basis. Monthly data on utility shutoffs by two local utilities, Xcel Energy and Centerpoint Energy, were collected from the Minnesota Public Utilities Commission. These data were aggregate in nature and therefore were not matched to the individual data collected from Hennepin County and the State of Minnesota.

### *Category 3: Data from Other Communities*

To gather data on family shelter usage patterns from around the country, this study relied on a convenience sample of fourteen communities plus publicly available data from New York City. I selected these communities based on guidance from Hennepin County staff as well as from feedback provided by an external consultant to the county. Of the fourteen requests for information on family shelter populations, five communities responded to the request: Ramsey County, Minnesota; Memphis, Tennessee; Washington, D.C.; the State of Massachusetts; and Multnomah County, Oregon. When combined with the data from New York City, this produced a sample of six communities. The data collected from these communities were aggregate and provided evidence of the total number of people (adults and children) that requested shelter, entered shelter, or were living in family shelter on a daily or monthly basis. Given the aggregate

nature of the data, specific analyses of family composition and demographics were not performed. In addition to the shelter data, telephone conversations with staff members from these communities provided additional information for use in this study.

[Table 1]

### *Data Analysis*

In this study, the data described above were imported to Stata 12.0 for descriptive and inferential statistical analysis. In all cases, linear regression models were used to assess the seasonal variation for a variety of dependent variables. Given the concern over non-stationarity and autocorrelation in time series data, Phillips-Perron tests for a unit root were conducted. As shown in Table 2 below, the only variable that showed strong presence of a unit root was the family shelter population time series data from Hennepin County. The other variables under consideration are requests, entries, and exits from shelter. In each of these cases, the data suggested the presence of unit root only when data was analyzed on a monthly basis. This may be the result of a radically reduced number of observations which may have contributed to the higher p values. Given the inconclusive results, multiple model specifications were used for variables with inconclusive results for the unit root tests. In these cases, the models adjusted for unit roots produced results very similar to the results from the standard linear regression. Therefore, only the analyses of the family shelter in Hennepin County include corrections for autocorrelation, while the remaining analyses rely on standard linear regression models.

[Table 2]

Three distinct model specifications are used to analyze data in this study. First, a standard ordinary least squares regression model is used when there is no presence of a unit root in the data. In this specification, month and year dummy variables are regressed to predict the

outcome variable of interest (shelter entries, shelter exits, shelter requests, evictions, or shutoffs).

To assess the monthly variation in the outcome variable of interest, the following regression model is used:

$$Y_t = \alpha m + \beta y + \varepsilon_t$$

Where,  $Y_t$  is the number of entries/exits/requests/evictions/shutoffs on a monthly or daily basis at time  $t$ ,  $m$  indexes months, and  $y$  indexes years. I report the monthly coefficients that specify the difference in the predicted value for the dependent variable between a specific month and the reference month. For example, if the coefficient for June is 200, that implies that the predicted value of the dependent variable is 200 higher than for the reference month.

In cases where a unit root may be present, a revised regression model is specified in which the dependent variable is the first difference of the outcome variable of interest (shelter population) and the independent variables include month and year dummies as well as the lag of the first differenced dependent variable. This regression model has the following specification:

$$\Delta Y_t = \alpha m + \beta y + \gamma \Delta Y_{t-1} + \varepsilon_t$$

Where,  $\Delta Y_t$  is the first difference of the shelter population/shelter requests/shelter exits at time  $t$ ,  $m$  indexes months,  $y$  indexes years, and  $\Delta Y_{t-1}$  is the lag of the dependent variable ( $\Delta Y_t$ ) at time  $t$ . In this specification, the month coefficients represent the first difference, or monthly change, in shelter population for a specific month relative to the reference month.

The final model specification uses interaction terms in order to assess the behavior of two different classes of families – those with school-aged children and those without school-aged children. In order to analyze the seasonality of shelter population for families with and without school-aged children, the following regression equation was used:

$$\Delta Y_t = \alpha m + \beta y + \gamma f + \eta m * f + \theta y * f + \lambda \Delta Y_{t-1} + \varepsilon_t$$

Where,  $\Delta Y_t$  is the first difference of monthly shelter population at time  $t$ ,  $m$  indexes months,  $y$  indexes years,  $f$  is a categorical variable for whether a family has school-aged children,  $m*f$  is the interaction term between the school-aged and month dummy variables,  $y*f$  is the interaction term between the school-aged and year dummy variables, and  $\Delta Y_{t-1}$  is the lag of the dependent variable ( $\Delta Y_t$ ) at time  $t$ . In this model, the coefficients for the month interaction term represent the coefficient for families with school-aged children, while the coefficients for the month dummies that are not included in the interaction term provide the results for families with non school-aged children.

To facilitate greater understanding of the analytic models, I make two subjective decisions. First, I shade the peak, or surge months, in grey in order to highlight these months for the reader. Second, since regression coefficients are provided relative to a reference month, the month with the lowest coefficient is deemed the reference month. Therefore, the remaining coefficients are all positive and reflect the difference relative to the reference month.

## **Results**

### ***Hennepin County Shelter Seasonality***

Figure 1 below charts the daily family shelter population (total individuals) from 2004 until early 2014 in Hennepin County. This graphic provides visual evidence of the surge and the shaded regions in the graph represent the surge months of August, September, and October.

[Figure 1]

Table 3 below provides descriptive statistics regarding the changing nature of the family shelter population in Hennepin County. Two observations are notable. First, the monthly means suggest a strong seasonal pattern with the family shelter population peaking in the months of

August, September, and October. Second, yearly means demonstrate an upward trend in the family shelter population over time.

[Table 3]

In order to quantify the seasonal surge statistically, a linear regression model is used to analyze monthly variation. Given the results of the Phillips-Perron test found in Table 2, the family shelter population data in Hennepin County may have a unit root. As such, the regression model using the first difference of the shelter population is used to correct for this data attribute. This first-differenced regression model statistically confirms a seasonal pattern in the family homeless shelter system in Hennepin County. As summarized in Table 4 below, the regression coefficients reflect the average daily change in shelter population by month. The results suggest a surge in changes in shelter population in July, August, and September. While the shelter population is greatest in August, September, and October, this model suggests that the changes that produce the population surge commence a month earlier in July. This finding is generally consistent with expectations given the 45-day average family shelter stay in Hennepin County.

[Table 4]

### ***Shelter Seasonality in Other Communities***

As described in the review of literature, other scholars have noted seasonal trends in homeless shelter usage. The analysis summarized in Table 5 below seeks to bolster the findings from the literature by analyzing other geographic settings for evidence of seasonality in family shelter usage. The purpose of this analysis is to determine whether the surge experienced in Hennepin County is a function of policies and circumstances that are unique to Hennepin County, or whether this is a phenomenon that is present in other settings around the country.

Comparisons to other communities are a challenge given the different policy and program frameworks that exist around the country. Within our sample, three policies types exist. First, Washington, D.C. and Multnomah County, Oregon have seasonal policies that guarantee shelter during the cold winter months. Second, Hennepin County, Massachusetts, and New York City are “right to shelter” jurisdictions that guarantee family shelter access throughout the year. Finally, Ramsey County, Minnesota and Memphis, Tennessee do not provide guaranteed access to shelter. Jurisdictions without “right to shelter” policies may not experience a surge in shelter population due to the fixed capacity of their shelter systems; the shelter population would not reflect demand that exceeds shelter capacity. Therefore, requests for shelter, rather than shelter population, is used to provide a measure of seasonal variation in demand for family shelter services.

Of the communities that responded to the request for data, two had no evidence of a summer surge. Based on conversations with staffers, family shelter usage in Washington, D.C. (T. Fredricksen, personal communication, July 1, 2014) and Multnomah County, Oregon (R. Bak & T. Kingery, personal communication, July 30, 2014) is greater in the winter months than in the summer months. In both cases, these municipalities have “right to shelter” policies during the cold months, which means that eligible families are guaranteed shelter during the winter. In the case of Washington, D.C., shelter populations are kept purposefully low during the fall months to ensure that sufficient vacancies exist once the winter season arrives. Therefore, these two communities experience family shelter usage patterns that are opposite of those experienced in Hennepin County, but there are obvious policy explanations for this variation.

Table 5 summarizes the results from regression models of shelter requests in five communities in the sample: Hennepin County, the State of Massachusetts; Memphis, Tennessee;

New York City; and Ramsey County, Minnesota. The results of the regression models suggest the presence of a summer surge in requests for shelter in these five communities. The exact timing and duration of the surge in each community is different and may be a function of specific attributes unique to that setting (i.e. policy context, shelter system structure, weather, school calendar, and labor market attributes). In Hennepin County, shelter requests peak in July, August, and September. The data from Massachusetts suggests a surge in requests from June through November. In Memphis, higher levels in family shelter requests are present in February, June, and July. The New York City data show a pronounced increase in requests for shelter from July through September. Finally, the regression model for Ramsey County suggests a surge in requests that begins in July and lasts through October. The findings from this limited, comparative study strongly suggest that the shelter seasonality observed in Hennepin County is not unique to that specific geographic or policy context.

[Table 5]

### ***Potential Explanations of this Phenomenon***

The first step in determining potential explanations of the surge is to assess the role that length of stay, entries and exits play on the shelter population. After analyzing entries, exits, and length of stay, I developed a list of factors that may contribute to this phenomenon. This list was informed by conversations with Hennepin County employees and from the hypothesized causes outlined in the existing literature. The potential causes of the shelter surge that I analyze below include the impact of the school calendar, an increase in families moving into Hennepin County during the summer months, the inability to maintain doubled-up living situations during the summer months, and increased evictions and utility shutoffs during the summer.

#### ***Length of Stay***

To begin the analysis of the Hennepin County shelter surge, one must determine whether seasonal increases in length of shelter stay contribute to increased caseloads in the family shelters. In order to analyze the potential role of length of stay on shelter counts, a standard regression model was run to see how length of stay varies throughout the year based on month of entry. As Table 6 below demonstrates, there are no statistically significant differences throughout the year, which strongly suggests that changes in length of stay are not the cause of the caseload surge experienced in Hennepin County.

[Table 6]

#### *Increased Entries or Reduced Exits*

Given that length of stay does not explain the surge, it is important to understand if the increase in shelter population is a function of increased entries into shelter, reduced exits, or both. An entry occurs at the beginning of a new shelter spell (defined in the Methods section) and an exit occurs at the conclusion of the spell. The daily data for entries and exits showed no evidence of a unit root so a standard linear regression model is used in this analysis. Table 7 summarizes the results of this model and the coefficients suggest that entries increase meaningfully in June and peak during July, August, and September. This increase in entries precedes the surge in shelter population by one month, which is consistent with the roughly 45 day average stay in Hennepin County family shelters. The analysis of exits suggests that exits from shelter generally follow a pattern similar to that of the shelter population. Exits are greatest from August through November, which is the period with the highest shelter population. Therefore, this analysis demonstrates that the Hennepin County family shelter surge is driven by increased entries into the shelter system and not a reduction in exits during the summer and fall months. Given that

increased entries appear to cause the surge, the following potential drivers of increased entries into shelter are investigated.

[Table 7]

### *School Calendar*

A potential explanation for the summer/fall surge in family shelter population is the impact of the school calendar on family decision-making. One potential hypothesis is that families in difficult housing circumstances struggle to maintain stability through the remainder of the school year and then choose to enter shelter once school is out of session. Another hypothesis is that many unstably housed families rely on doubled-up situations with friends or family that become increasingly difficult to maintain once children are out of school and around the home during the summer. The impact of the school calendar on family shelter usage was noted in both the literature as well as in discussions with Hennepin County staff. Therefore, the following analysis attempted to identify the role of the school calendar on family shelter usage.

In order to isolate the impact of the school calendar on shelter population, families in the Hennepin County shelter database were broken out into two categories: families with at least one school-aged child (defined as a child five years old or older) and families without any school-aged children. Figure 2 below shows the trend in shelter population for both categories of families. Visually, it appears that there is limited variation throughout the year among families without school-aged children, but the population of families with school-aged children peaks significantly during the summer and fall months, consistent with the overall surge in family shelter population. During the period of the study, the school year generally ended in early June in Hennepin County.

[Figure 2]

To assess the behavioral responses of families both with and without school-aged children, a regression model with interaction terms was used. The results of this first differenced regression model, summarized in Table 8, suggest that families with school-aged children behave differently than do families without school-aged children. The coefficients for the interaction term show a surge in shelter population from June through September for families with school-aged children, while families with non-school-aged children – represented by the coefficients on the month dummies – show no statistically significant variation throughout the year. This model strongly suggests that families with school-aged children drive the surge in shelter population during the summer and fall. This result does not provide a causal explanation for the surge, but it does suggest that interventions designed to address the surge should target families with school-aged children.

[Table 8]

To underscore this finding, additional regression models with interaction terms are used to assess the behavior of families with and without school-aged children. First, a regression model analyzes the length of stay by month of entry for both categories of families. This analysis finds no difference in the length of stay throughout the year or between the two types of families. Therefore, the analytical focus shifts to the seasonality of entries and exits for families with and without school-aged children. The results, summarized in Table 9 below, demonstrate a strong seasonal pattern for families with school-aged children. For such families, entries into shelter are significantly greater from June through October, while exits from shelter experience an increase from October through December. Interestingly, the coefficient for exits is lowest in May, which corresponds with the end of the school year. This lends credence to the hypothesis

that families seek to maintain stability through the end of the school year, whether in or out of shelter.

For families with non school-aged children, there is no discernable pattern in entry behavior. None of the coefficients are statistically significant throughout the year. For exits, only the month of December shows a statistically significant higher level of exits. This may be due to extended family or friends offering housing to shelter families over the holiday season. Table 9, therefore, demonstrates in finer detail that different behavior patterns exist for families depending on the age of their children.

[Table 9]

#### *Non-resident Families Drive Summer Shelter Demand*

A second hypothesis to explain this surge is that non-resident families move to Hennepin County to take advantage of the relatively favorable social services and guaranteed access to shelter. Shelter staff determine residency status for families during shelter intake interviews; a resident family is one in which the householder has lived in Hennepin County for over thirty days. Table 10 below summarizes regression models that predict the level of shelter requests and shelter entries for both residents and non-residents.

[Table 10]

The regression coefficients suggest that there is a summer/fall surge among both residents and non-residents. Entries into shelter peak in July, August, and September for resident families, and the same phenomenon exists for non-resident families. Figure 3 below provides visual evidence of the impact of non-resident families on the summer/fall surge. Given the relative lack of non-resident entries during the non-surge months, the effect of non-residents is primarily

evident during the summer surge months. This analysis suggests that non-residents are not the cause of the surge, but they do contribute to its severity.

[Figure 3]

#### *Failure to Maintain Doubled-up Status*

In conversations with Hennepin County employees, staffers repeatedly hypothesized that families may be unable to maintain a doubled-up status after the end of the school year. The fact that children no longer leave the home during the day may cause such an arrangement to be increasingly burdensome for the host. In addition, it may be easier for the host to tell the guest family that it is time to leave once the harsh winter conditions have given way to warmer weather.

The coded interview responses provided the data needed to test this hypothesis. One of the questions asked during shelter intake interviews is the reason for the family's homeless status. Common answers include eviction, a move, lack of money, or the inability to stay with family or friends. The importance of doubled-up living situations became evident after a review of this data because over 60% of all respondents cited the inability to continue to stay with friends or family as a reason for their homelessness. I broke out the responses by month to see if there was a seasonal trend in doubled-up status as a reason for homelessness. Table 11 summarizes a logistic regression model that indicates that there were no statistically significant differences throughout the year. Therefore, there is substantial evidence that supports the hypothesis that many people enter shelter after a spell in a doubled-up living situation, but there is no evidence to suggest that terminated doubled-up situations is a primary driver of the family shelter surge in Hennepin County.

[Table 11]

### *Evictions and Utility Shutoffs*

Given the link between evictions and shelter entry described in the academic literature, this study analyzes whether there is a seasonal pattern in evictions and utility shutoffs that may contribute to the seasonal trends found in the Hennepin County family shelters. Unfortunately, due to data limitations, attempts to link eviction and utility data to the Hennepin County micro data for individuals were unsuccessful. The eviction and utility data lack the individual details needed to match the data to the shelter database. Therefore, I only offer general contextual observations about the seasonality of evictions and utility shutoffs.

The first general observation, as outlined in Table 12, is that evictions in Hennepin County do increase once the weather warms in the spring. Using data from the Hennepin County court system over eight years, I find that evictions are greatest during January, June, July, and August. January evictions appear to be an attempt to catch-up for a dearth of evictions in November and December, which may be due to landlords who may be reluctant to evict over the holiday season. Following the January peak, evictions quickly decline for the remainder of the winter months until there is a significant pickup in evictions during the summer.

Second, policy significantly influences the seasonality of utility shutoffs in Minnesota. The State of Minnesota Cold Weather Rule provides households with the opportunity to prevent their utilities from being shut off during the cold winter months. The Cold Weather Rule takes effect on October 15 and lasts until April 15. The impact of the Cold Weather Rule is evident in the regression results in Table 12 as shutoffs are greatest during May through September. As with eviction data, the utility data is aggregate in nature and therefore it is impossible to link that data to the individuals in the shelter system. While neither the eviction nor the shutoff data

explains the surge, these data do support the concept of increased residential mobility in the summer months, especially among vulnerable households.

[Table 12]

### *Summary of Explanations*

The analysis of potential drivers of the family shelter surge produced four notable takeaways. First, the Hennepin County surge is a function of increased entrants into the shelter system, rather than a reduction in exits. Second, non-resident families exacerbate the surge, but strong seasonal demand for shelter exists among the resident population. Third, a significant percentage of families seeking shelter in Hennepin County do so following a spell in a doubled-up housing situation. Finally, families with school-aged children are the primary driver of the Hennepin County surge; this is the most significant finding of the study.

### *Limitations*

While this study seeks to provide a deeper understanding of the phenomenon of surges in family homeless shelter usage, the explanations described herein are not causal. A follow-up study is currently underway in which qualitative methods will be used to develop a causal understanding of this phenomenon. The utility of the study is therefore to identify a sub-population that drives the surge, rather than to explain its causes.

A second limitation of the study is its limited generalizability. The unique attributes of shelter systems makes generalizing the findings of this study difficult. The comparative analysis in this study was used to demonstrate that seasonal variation is not unique to Hennepin County, but this comparison cannot be used to suggest that families with school-aged children drive the surge in each of these communities. Further analysis of the composition of the shelter population in other communities is needed to generalize this finding more broadly.

Finally, this study does not provide an explanation for the persistence of the surge into the fall months. One of the key areas of interest in the follow-up, qualitative study is to understand why families with school-aged children continue to enter shelter at significantly higher rates in the months of August and September. The follow-up study will also seek to develop an understanding of what mechanisms produce the easing of surge conditions in the late fall.

### **Policy Implications**

Given the damaging consequences of shelter entry on families and children homelessness, prevention policies and programs have been a popular response to this troubling social problem. While well-intentioned, homelessness prevention programs have suffered from a lack of efficiency given the poor targeting of individuals or families who are likely to face homelessness (Apicello, 2010; Culhane, Metraux, & Byrne, 2011). As a result, federal and state dollars targeting homelessness have primarily been directed toward individuals and families who are already homeless (Shinn, Baumohl, & Hopper, 2001). As Culhane et al. noted, the key to a successful homeless prevention program is to target program resources toward those families or individuals who are likely to become homeless in the absence of resources, while limiting provision of resources to others who may be able to avoid a bout of homelessness without support. One such effort to improve efficiency was the model developed by Shinn et al. (2013) in New York City to improve upon the targeting of homelessness prevention resources. Improved targeting will be critical in order to increase the effectiveness of homelessness prevention programs and policies.

A key policy contribution of this study is that it provides preliminary findings that may help to improve the targeting of homelessness prevention resources. First, in order to address

family shelter surge conditions, prevention resources could be directed to families with school-aged children. Pre-existing relationships between schools and families may provide the opportunity to target resources toward those families designated as homeless or highly mobile by the local school district. Second, the results of the study suggest that the end of the school year is a high-risk time for shelter entry for families with school-aged children and therefore prevention resources may be directed to homeless/highly mobile families during this period. It is important to note that these findings are based on a single site and therefore, these findings are preliminary and may, or may not, apply to other jurisdictions. A key constraint on the generalizability of these findings is local shelter policies. As demonstrated in this study, local policies have a material impact on shelter usage patterns.

Based on the results of this study, in early 2015, Hennepin County secured state funding to expand its prevention program for families. This initiative will provide funding to support a county-contracted homeless service provider to provide services to the families of homeless and highly mobile students in higher risk Minneapolis public schools prior to the end of the school year. The specific program elements will include a broad range of wrap-around services and rent support. The full details of the school-based program have yet to be finalized, but the pilot program will provide between \$120,000 and \$175,000 during 2016 and 2017 for this effort. A future evaluation will examine the relative costs and benefits of the program and its overall success in preventing shelter entry among vulnerable families.

In summary, this study contributes to the understanding of homelessness in two material respects. First, it provides empirical evidence about the potential drivers of family homeless shelter entry. Second, it generates knowledge that may help practitioners and policymakers more efficiently direct scarce homelessness resources in order to prevent shelter entry for families.

Importantly, the findings of this study have provided the empirical support for a newly funded prevention program to be implemented in Hennepin County, Minnesota.

**Acknowledgments**

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**Notes on Contributor**

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Table 1

Table 1. Summary of data sources.

Data Source	Description	Dates
<b>Category 1</b>		
State of Minnesota MAXIS data system	Daily data on shelter entry/exit dates and demographic information on families in the Hennepin County shelter system.	2004 – 2014
Hennepin County Shelter Data	The Hennepin County shelter team collects daily data on families during the application and admission process. Data from this source was used in the analysis of shelter requests and the residency status of families seeking shelter.	2006 – 2014
Hennepin County Intake Interview Forms	839 intake interview forms were analyzed. On each form the response to the question “Reason for Homelessness Today” was coded.	2013 – 2014
<b>Category 2</b>		
Hennepin County court system	The Hennepin County court system provided data on the number of evictions on a monthly basis.	2006 – 2013
Minnesota Public Utilities Commission	Monthly data on the number of utility shutoffs by Xcel Energy and Centerpoint Energy was collected from the Minnesota Public Utilities Commission website.	2009 – 2013
<b>Category 3</b>		
Ramsey County Community Health Services	Monthly requests or applications for family shelter entry	2010 – 2013
Massachusetts Department of Housing and Community Development	Daily requests or applications for family shelter entry	2009 – 2014
Community Alliance for the Homeless, Memphis, Tennessee	Monthly requests or applications for family shelter entry	2009 – 2014
New York City, Department of Homeless Services	Daily requests or applications for family shelter entry	2012 – 2015
The Community Partnership for the Prevention of Homelessness, Washington, D.C.	Description of family shelter usage patterns, via interview	Not relevant
Multnomah County, Portland, Oregon	Descriptions of family shelter usage patterns, via interview	Not relevant

Table 2

Table 2. Phillips-Perron Test for Unit Root

Variable	Data Frequency	Observations	Phillips-Perron Test								
			Without Lags or Trend			With 1 lag, no trend			With 1 lag and trend		
			p value	Unit Root Critical Value		p value	Unit Root Critical Value		p value	Unit Root Critical Value	
	1%	5%		1%	5%		1%	5%			
Shelter count - Hennepin <sup>a</sup>	Daily	3735	0.037	Yes	No	0.026	Yes	No	0.000	No	No
Shelter count - Hennepin <sup>b</sup>	Monthly	122	0.480	Yes	Yes	0.314	Yes	Yes	0.008	No	No
Requests - Hennepin <sup>c</sup>	Monthly	100	0.089	Yes	Yes	0.103	Yes	Yes	0.005	No	No
Entries - Hennepin <sup>a</sup>	Daily	2761	0.000	No	No	0.000	No	No	0.000	No	No
Entries - Hennepin <sup>b</sup>	Monthly	122	0.000	No	No	0.000	No	No	0.000	No	No
Exits - Hennepin <sup>a</sup>	Daily	2749	0.000	No	No	0.000	No	No	0.000	No	No
Exits - Hennepin <sup>b</sup>	Monthly	122	0.018	Yes	No	0.038	Yes	No	0.000	No	No
Requests - Massachusetts <sup>d</sup>	Daily	1286	0.000	No	No	0.000	No	No	0.000	No	No
Requests - Massachusetts <sup>e</sup>	Monthly	79	0.005	No	No	0.004	No	No	0.002	No	No
Requests - Memphis <sup>f</sup>	Monthly	52	0.059	Yes	Yes	0.049	Yes	No	0.034	Yes	No
Requests - New York City <sup>g</sup>	Daily	750	0.000	No	No	0.000	No	No	0.000	No	No
Requests - New York City <sup>h</sup>	Monthly	27	0.277	Yes	Yes	0.245	Yes	Yes	0.302	Yes	Yes
Requests - Ramsey County <sup>i</sup>	Monthly	47	0.098	Yes	Yes	0.068	Yes	Yes	0.256	Yes	Yes

a Source: Hennepin County and State of Minnesota MAXIS database; daily data from 2004 - 2014.

b Source: Hennepin County and State of Minnesota MAXIS database; monthly data from 2004 - 2014.

c Source: Hennepin County; monthly data from 2006 - 2014.

d Source: Massachusetts Department of Housing and Community Development; daily data from 2009 - 2014.

e Source: Massachusetts Department of Housing and Community Development; monthly data from 2009 - 2014.

f Source: Community Alliance for the Homeless, Memphis, Tennessee; monthly data from 2009 - 2014.

g Source: New York City Department of Homeless Services; daily data from 2012 - 2015.

h Source: New York City Department of Homeless Services; monthly data from 2012 - 2015.

i Source: Ramsey County Community Human Services; monthly data from 2010 - 2013.

Table 3

Table 3. Hennepin County Family Shelter Population – Descriptive Statistics

	Shelter Population	
	Mean	SD
January	381.6	186.2
February	353.8	172.6
March	347.3	146.2
April	332.3	115.6
May	354.8	132.0
June	382.5	154.7
July	425.2	160.9
August	505.0	172.2
September	566.9	200.5
October	542.3	208.1
November	497.0	188.9
December	412.1	169.6
2004	247.2	49.0
2005	250.3	63.2
2006	243.5	74.8
2007	310.1	80.3
2008	411.3	88.4
2009	445.5	110.2
2010	438.1	114.4
2011	506.3	114.5
2012	615.6	160.1
2013	701.0	119.5

Based on daily data from 2004-2014.

Source: Hennepin County and State of Minnesota MAXIS database.

Table 4

Table 4. Monthly regression coefficients for the change in Hennepin County family shelter population

	Dependent Variable	
	Differenced Shelter Population	
	Coefficient	SE
January	3.6*	1.43
February	1.9	1.46
March	3.0*	1.43
April	3.4*	1.46
May	3.6*	1.45
June	3.4*	1.46
July	5.3***	1.45
August	4.3**	1.45
September	4.5**	1.46
October	1.1	1.45
November	1.0	1.46
December	-	-
F Statistic	2.5	
Adj. R Squared	0.009	

\* p value < .05; \*\* p value < .01; \*\*\* p value < .001

Based on daily data from 2004-2014.

Source: Hennepin County and State of Minnesota MAXIS database.

Table 5

Table 5. Monthly regression coefficients for shelter requests in other communities

	Dependent Variables: Requests or Applications for Shelter Entry				
	Hennepin County <sup>a</sup>	Massachusetts <sup>b</sup>	Memphis <sup>c</sup>	New York City <sup>d</sup>	Ramsey County <sup>e</sup>
January	48.8**	0.90	95.2	10.4	116.8
February	-	0.17	347.9**	-	-
March	41.8*	-	110.4	3.3	69.75
April	73.0***	0.42	-	11.8	127.75
May	67.0***	1.62*	106.8	11	192.25
June	99.0***	2.30**	372.1**	15.6	296.3*
July	152.9***	5.39***	295.6**	30.6**	429.8**
August	173.7***	2.65**	84	40.9**	453.5**
September	175.5***	2.70**	193.8*	42.2**	436.3**
October	124.0***	1.49	136.4	23.7**	370.5**
November	73.4***	2.61**	149.6*	21.1*	229.8*
December	37.9*	0.68	209.9*	8.6	140.8
F Statistic	44.1	20.6	5.2	22.8	4.2
Adj. R Squared	0.891	0.176	0.558	0.269	0.489

\* p value < .05; \*\* p value < .01; \*\*\* p value < .001

a Source: Hennepin County; monthly data from 2006-2014.

b Source: Massachusetts Department of Housing and Community Development; daily data from 2009-2014.

c Source: Community Alliance for the Homeless, Memphis, Tennessee; monthly data from 2009-2014.

d Source: New York City Department of Homeless Services; daily data from 2012 - 2015.

e Source: Ramsey County Community Human Services; monthly data from 2010-2013.

Table 6

Table 6. Monthly regression coefficients for Hennepin County family shelter length of stay

	Length of Stay (days)	
	Coefficient	SE
January	3.0	1.8
February	2.7	1.9
March	2.4	1.9
April	0.9	1.8
May	-	-
June	1.9	1.8
July	0.6	1.7
August	3.2	1.6
September	2.7	1.7
October	3.0	1.8
November	2.9	1.9
December	0.6	2.0
F Statistic	6.2	
Adj. R Squared	0.01	

\* p value < .05; \*\* p value < .01; \*\*\* p value < .001

Based on daily data from 2004-2014.

Source: Hennepin County and State of Minnesota MAXIS database.

Table 7

Table 7. Monthly regression coefficients for Hennepin County family shelter entries, and exits

	Dependent Variables			
	Entries		Exits	
	Coefficient	SE	Coefficient	SE
January	1.6*	0.7	-	-
February	-	-	0.2	0.8
March	0.9	0.7	1.5	0.8
April	2.1**	0.8	1.6	0.8
May	2.6**	0.7	1.5	0.8
June	4.0***	0.8	3.4***	0.8
July	5.8***	0.7	3.0***	0.8
August	7.3***	0.7	5.7***	0.8
September	7.0***	0.8	5.4***	0.8
October	4.5***	0.7	5.7***	0.8
November	2.6**	0.8	4.8***	0.8
December	0.6	0.7	3.2***	0.9
F Statistic	19.8		14.9	
Adj. R Squared	0.10		0.07	

\* p value < .05; \*\* p value < .01; \*\*\* p value < .001

Based on daily data from 2004-2014, total number of people.

Source: Hennepin County and State of Minnesota MAXIS database.

Table 8

Table 8. Regression model for families with school-aged children and non-school-aged children

	Shelter Population (First Difference)			
	Families with School-Aged Children		Families with Non School-Aged Children	
	Coefficient	SE	Coefficient	SE
January	2.58	1.37	1.23	0.96
February	1.98	1.40	1.10	0.98
March	2.62	1.37	1.16	0.96
April	2.54	1.38	1.11	0.97
May	2.60	1.37	1.16	0.96
June	4.24**	1.38	1.05	0.97
July	3.88**	1.37	1.19	0.96
August	2.99*	1.37	0.97	0.96
September	3.54**	1.38	1.15	0.97
October	1.74	1.40	0.25	0.98
November	-	-	1.06	0.99
December	0.87	1.40	-	-
F Statistic	1.31		1.31	
Adj. R Squared	0.002		0.002	

\* p value < .05; \*\* p value < .01; \*\*\* p value < .001

Based on daily data from 2004 - 2012.

Source: Hennepin County and State of Minnesota MAXIS database.

Table 9

Table 9. Regression model analyzing entries and exits for families with and without school-aged children

	Entries		Exits	
	School-Aged	Non School-Aged	School-Aged	Non School-Aged
January	10.8	28.2	23.5	16.1
February	44.6	-	42.2	22.3
March	49.3	1.5	43.0	14.9
April	28.5	8.3	18.8	36.1
May	51.8	22.0	-	17.3
June	118.8**	7.9	10.0	34.2
July	111.5**	20.8	27.4	-
August	149.4**	52.1	71.0	32.8
September	188.5***	29.9	92.5	43.6
October	118.0**	26.6	97.2*	52.0
November	52.7	24.9	156.3**	38.3
December	-	0.9	98.5*	74.8*
F Statistic	14.6		10.5	
Adj. R Squared	0.116		0.084	

\* p value &lt; .05; \*\* p value &lt; .01; \*\*\* p value &lt; .001

Based on daily data from 2004 - 2012.

Source: Hennepin County and State of Minnesota MAXIS database.

Table 10

Table 10. Monthly regression coefficients for Hennepin County family shelter requests and entry by residency

	Residents		Non-residents	
	Requests	Entries	Requests	Entries
January	52.7**	16.7*	6.4	3.8
February	-	-	-	-
March	31.7	10.7	17.9**	8.0*
April	69.7***	21.6**	16.1*	7.6*
May	55.4**	15.9*	18.6**	7.0*
June	84.4***	28.0***	34.4***	17.4***
July	127.6***	39.9***	46.7***	20.3***
August	133.6***	41.6***	63.0***	30.2***
September	145.4***	42.8***	55.5***	24.5***
October	103.8***	33.4***	21.6**	6.9*
November	72.1***	20.5**	18.5**	7.2*
December	49.5*	11.9	5.6	3.7
F Statistic	28.2	16.4	19.4	9.5
Adj. R Squared	0.858	0.773	0.803	0.653

\* p value < .05; \*\* p value < .01; \*\*\* p value < .001

Based on daily data from 2004 - 2012.

Source: Hennepin County and State of Minnesota MAXIS database.

Table 11

Table 11. Monthly logistic regression odds ratios for a family citing the inability to maintain a doubled-up status as a reason for shelter entry

	Dependent Variable	
	Odds of Doubled-Up Reason	
	Odds Ratio	SE
January	0.90	0.32
February	0.79	0.29
March	0.73	0.25
April	1.09	0.39
May	0.72	0.25
June	0.53	0.18
July	0.69	0.23
August	0.58	0.22
September	0.91	0.45
October	0.39	0.17
November	1.10	0.47
December	-	-
Pseudo R Squared	0.012	

\* p value < .05; \*\* p value < .01; \*\*\* p value < .001

Based on daily data from 2004 - 2012.

Source: Hennepin County and State of Minnesota MAXIS database.

Table 12

Table 12. Monthly regression coefficients for Hennepin County evictions and utility shutoffs

	Dependent Variables					
	Evictions <sup>a</sup>		Xcel Energy Shutoffs <sup>b</sup>		Centerpoint Shutoffs <sup>b</sup>	
	Coefficient	SE	Coefficient	SE	Coefficient	SE
January	269.6***	34.6	121.8	242.1	61.0	281.9
February	-	-	106.4	242.1	-	-
March	100.1**	34.6	78.8	242.1	232.8	281.9
April	143.5***	34.6	808.8**	242.1	973.5**	281.9
May	195.9***	34.6	1,637.0***	242.1	2,244.0***	296.2
June	281.1***	34.6	1,927.0***	242.1	3,661.2***	296.2
July	271.4***	34.6	2,158.2***	242.1	4,559.4***	296.2
August	282.6***	34.6	1,896.4***	242.1	5,230.0***	296.2
September	162.1***	34.6	1,545.0***	242.1	4,755.4***	296.2
October	149.3***	34.6	401.8	242.1	1,949.6***	296.2
November	75.8*	34.6	238.4	242.1	696.4*	296.2
December	65.8	34.6	-	-	83.4	296.2
F Statistic	29.0		22.3		75.1	
Adj. R Squared	0.842		0.844		0.946	

\* p value < .05; \*\* p value < .01; \*\*\* p value < .001

a Source: Hennepin County court system; based on monthly data from 2006 - 2013.

b Source: Minnesota Public Utility Commission; based on monthly data from 2009 - 2014.

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Figure 1. Daily Hennepin County family shelter population: 2004–2014

Figure 1 Note: shaded regions represent surge months of August, September, and October.

Figure 2. Hennepin County family shelter entries by residency status

Figure 3. Families with and without school-aged children in Hennepin County family shelter:  
2004–2011